

## **Effectiveness of Restored Wetlands for the Treatment of Agricultural Runoff**

Ronald Landy  
Regional Scientist  
Reg.III, EAID  
(410) 305-2757  
landy.ronald@epa.gov

**Authors:** T. Barthelmeh, T. Canfield, R. Poeske, and R. Landy

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Delaware has community and private drainage systems dating back to the 1700s. These channels were constructed to better manage soil and water resources and to provide flood protection. Without effective drainage, soils become saturated or flooded, thereby preventing efficient farming operations as well as creating drainage problems for cities, towns, and urban areas. In addition, crops impacted by flooding or poor drainage often underutilize nutrients, contributing to downstream nutrient runoff. These community drainage systems (tax ditches) are governmental subdivisions of the State and are watershed-based organizations formed by a prescribed legal process in Superior Court. To date, 228 individual tax ditch organizations have been formed statewide to manage more than 2,000 miles of channels. Along with another 2000 miles of private (on farm) drainage systems, these channels provide water management capabilities for more than 350,000 acres of land in Delaware. By linking many of Delaware's farms to receiving streams, tax ditches can act as conduits for agricultural runoff/non-point source pollution. Although channels themselves produce very little nutrients or sediment, they do represent a transport mechanism to downstream areas for these parameters that are entering the tax ditches from the surrounding watershed. Many of Delaware's tax ditches have been listed on Delaware's Clean Water Act 303 (d) impaired waters list and are subject to the development of Total Maximum Daily Loads (TMDLs). There is a need to reduce the level of nutrient and sediment inputs to the tax ditches. The goal of this project is to determine the ability of restored wetlands to assimilate nutrients from agricultural runoff before they enter downstream waters. The data was collected from a subsample of approximately 200 restored/constructed wetlands completed by the Delaware Department of Natural Resources and Environmental Control in recent years. Results will be used to help improve design standards for future restoration and non-point source nutrient education efforts.